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Nos. 674

In the Supreme Court of the United States

OCTOBER TERM, 1970

UNITED STATES OF AMERICA, PETITIONER

v.

THE GARRETT CORPORATION

UNITED STATES OF AMERICA, PETITIONER

v.

SAMUEL L. PALMER AND STANDARD PARTS & EQUIPMENT CORPORATION

PETITION FOR WRITS OF CERTIORARI TO THE UNITED STATES COURT OF CLAIMS

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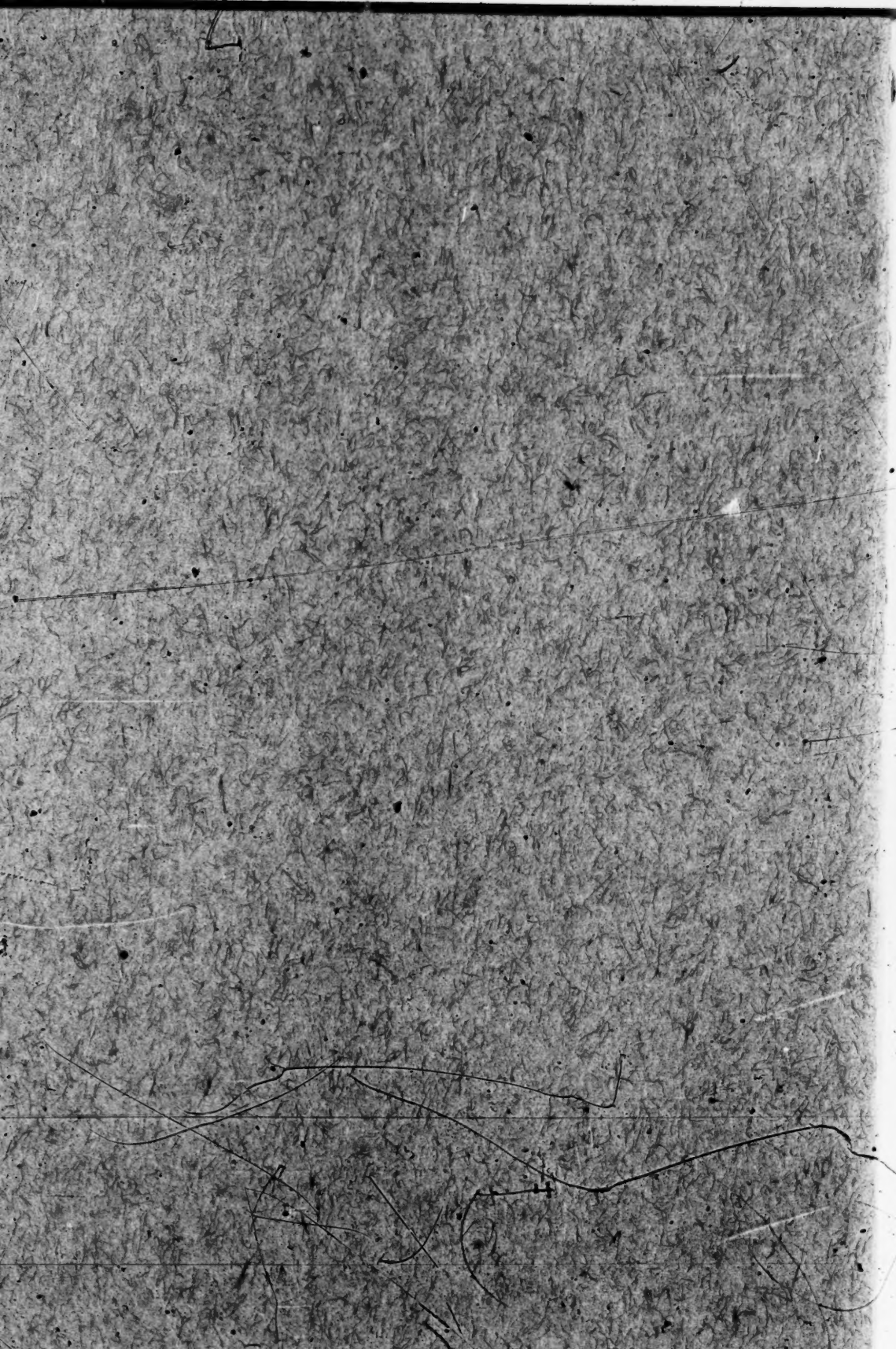

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The Solicitor General, on behalf of the United States, petitions for writs of certiorari to review the judgments of the United States Court of Claims in the above cases.

OPINIONS BELOW

The opinion of the Court of Claims in the *Garrett* case (App. A., *infra*, pp. 15–51) is reported at 422 F. 2d 874. The opinion of the Court of Claims in the *Palmer*

case (App. B., *infra*, pp. 52–76) is reported at 423 F. 2d 316.

JURISDICTION

The judgment of the Court of Claims in *Garrett* was entered on February 20, 1970 (App. A., p. 16) and a timely filed petition for rehearing was denied on May 15, 1970. On August 8, 1970, Mr. Justice Black extended the time for petitioning for certiorari to and including September 10, 1970.

The judgment of the Court of Claims in *Palmer* was entered on March 20, 1970 (App. B., p. 53) and a timely filed petition for rehearing was denied on June 12, 1970. The time for filing a petition for a writ of certiorari expires on September 10, 1970.

In each case the jurisdiction of this Court is invoked under 28 U.S.C. 1255(1).

QUESTION PRESENTED

In these two suits brought against the United States for infringement under 28 U.S.C. 1498, the Court of Claims held non-obvious and hence valid three patents whose sole differences over the prior art are, respectively: (1) the location of port holes in a ballast pocket on a boarding ramp for a life-raft; (2) the angle of inclination of supporting posts for a canopy over a life-raft; and (3) the idea that a flexible "bean bag" support for emergency airfield landing lights would be "normally empty" of ballast when not in use. The question is whether the constitutional and statutory standard of invention explicated by this Court in *Graham* v. *John Deere Co.*, 383 U.S. 1, has been violated by these decisions.

CONSTITUTIONAL PROVISION AND STATUTE INVOLVED

Article I of the Constitution provides in pertinent part:

> Section 8. The Congress shall have Power
>
> * * * * *
>
> To Promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.

Title 35 of the United States Code provides in pertinent part:

> § 101. Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
>
> * * * * *
>
> § 103. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the difference between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

STATEMENT

These two suits were brought against the United States in the Court of Claims under 28 U.S.C. 1498 to recover for infringement of three alleged inventions.

1. In *Garrett*, plaintiff claimed that the government had infringed two patents relating to improvements on an inflatable life raft. The raft, which is admittedly old, is comprised of two inflatable tubes encircling a fabric floor. United States Letters Patent No. 2,914,779 (the "Walker" patent) describes a ramp for boarding the raft from the water. United States Letters Patent No. 2,804,633 (the "Taylor" patent) discloses a structure for mounting and supporting a canopy over the raft.

a. The Walker boarding ramp consists of a pair of parallel inflatable tubes, attached to the raft in cantilever fashion. The tubes extend outward from the raft and are connected across their tops by impervious fabric to form a deck-like surface to which handles are attached to assist boarding from the water. The deck fabric extends around the outboard end of the tubes and is turned up and secured to the underside of the deck to form a water ballast pocket at the end of the ramp. The pocket has ports underneath the deck near the surface and above the normal water line of the ramp. Thus water enters the ballast pocket when the inlet ports are submerged (usually in boarding). Water is retained in the pockets as ballast when the ramp returns to its normal position.[1]

[1] The pertinent portion of the patent specification states:

"When the ramp is boarded from the water the free end of the beams [*i.e.*, tubes] * * * will yield slightly so that the upper surface of the deck member will be substantially at water level. When the ramp is in this position the ports * * * will be below the normal or average water line and water will flow through the ports into the water ballast pocket * * *. * * * *

The use of water ballast pockets as a stabilizer has long been well-known in the field of inflatable life rafts.[2] Claim 3, which is the only claim at issue here, is based on the location of the inlet holes. It defines the Walker ballast pocket as having "access means located above the normal water line when the ramp is unoccupied for admitting water to said pocket."

In response to the claim of infringement, the United States contended that the Walker patent was invalid under 35 U.S.C. 103 for lack of invention over the prior art, since it was obvious that locating inlet holes above the normal water line would allow more water to be retained in the ballast pocket when the boarding ramp was depressed. Trial Commissioner Davis rejected this contention, holding that placement of the water holes above the normal water line was an unobvious and patentable improvement over the prior art. In a *per curiam* opinion, the Court of Claims adopted the commissioner's findings and conclusions, two judges dissenting (App. A. pp. 22–23).

b. The Taylor patent teaches a way to make the canopy atop the life raft cover a more extensive area. The canopy is supported much like a conventional tent. On the prior art raft, the canopy was attached to vertical poles socketed to the inside circumference

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The ports * * * are intentionally located above the normal water line * * * when the boarding ramp is unoccupied so that a larger quantity of water will be maintained in the pocket * * *. Thus, this boarding ramp, while functioning to facilitate entry onto the life raft * * *, additionally functions to provide stability to the entire raft" (App. A., p. 17).

[2] Such a ballast pocket is shown on the inflatable raft disclosed in a 1944 Army specification (Exhibit DX–33, before the Court of Claims). Another disclosure is in Exhibit DX–34. We are lodging copies of these exhibits with the Clerk of this Court.

of the upper circular flotation tube and the raft floor. The Taylor invention angles the poles outward (at about a 45° angle), fastening them to the tube only. The outward inclination of the posts permits the canopy to extend over the raft tubes, like eaves, to provide better protection against sun and weather. A "weather cloth" may be extended downward from the outer edges for greater protection.[3]

The trial commissioner again rejected the government's contention that these improvements were obvious. He upheld the validity of all three claims, and the Court of Claims adopted his opinion *per curiam*, again with two judges dissenting. The basis of patentability, the court held, was that the canopy posts were mounted higher than previously and inclined outward, with the result that fewer and shorter posts were needed to support the canopy (App. A., pp. 29–30).

2. In *Palmer*, the plaintiff claimed infringement of a patent on an improved emergency landing light for air-

[3] Claims 1–3 define the canopy structure in combination with a life raft. Claim 1 is representative:

"1. A life raft comprising—

a flexible-walled, fluid distensible buoyancy member of substantially circular cross-sectional shape,

a canopy-supporting post, and

means for supporting said post, wholly from said buoyancy member, in an outwardly inclined position, said means comprising

post-holding means secured to the inboard side of the fluid distensible buoyancy member and wholly supported directly thereby."

Claim 2 defines the "post-holding means" as "an apertured fabric member" and a "molded rubber tubular member." Claim 3 adds the hinged clip, defined as "means for limiting endwise movement of the post" (App. A., p. 27).

fields (U.S. Letters Patent No. 2,896,131). The device basically consists of a battery-operated light attached to a flexible bag base in which ballast, such as sand, rocks or gravel can be inserted.[4] Prior patents existed on battery-operated emergency lights with permanently weighted rigid bases. Prior patents also existed on flexible bag bases filled with ballast, for supporting various articles, such as reading lamps or baby bottles on uneven, slippery or yielding surfaces. The Patent Office initially rejected the patent application on the ground that it constituted an obvious combination of these elements from the prior art. However, the Patent Office sustained the application when the provision that the bag supporting the landing light would be "normally empty" when not in use was added. The advantage of removing the ballast when the lights are not in use is that the bags are then lighter and easier to transport, and protected from deterioration. Trial Commissioner Davis agreed with the Patent Office, pointing out that none of the previous patents involving ballast-filled bags were designed with the idea that the ballast would be added only when the bag was in use. The Court of Claims adopted his opinion *per curiam*. (App. B. p. 52).

[4] The single Palmer patent claim reads as follows:

"An emergency light comprising a normally empty flexible bag, a self contained electric light unit comprising a battery housing, means supporting a light source in operative association with said housing, and a transparent cover enclosing said light source, means attaching said bag to said unit in such manner as to provide, when filled with suitable loose weights, a base for said unit, an aperture in said bag through which said weights may be inserted or removed, and means for opening said aperture to permit filling said bag (App. B., p. 56).

These rulings of the Court of Claims were, we submit, erroneous under the standard of invention articulated by this Court in *Graham* v. *John Deere Co.*, 383 U.S. 1. There is reason to believe, moreover, that these decisions, which might not merit the attention of this Court if they represented merely isolated examples, illustrate a general tendency on the part of the Court of Claims to apply a much laxer standard than that prescribed in *Graham*. This trend, if uncorrected, will have a serious fiscal impact on the government and may substantially and unwarrantably impair competition in the procurement of government contracts.

1. Our basic position is that the three patents upheld in these two cases involve only advances that are obvious in light of the prior art. They epitomize the "insignificant variations and innovations of a commonplace sort," 383 U.S. at 16, which do not satisfy the constitutional standard of patentability that proscribes "issuance of patents whose effects are to remove existent knowledge from the public domain, or to restrict free access to materials already available." 383 U.S. at 6. See, also, *Anderson's-Black-Rock, Inc.* v. *Pavement Salvage Co.*, 396 U.S. 57; *Lear, Inc.* v. *Adkins*, 395 U.S. 653.

The Walker boarding ramp differs from the prior art only in the placement of the water inlet holes above the normal water level; prior art taught boarding ramps and the use of water ballast bags (App. A., pp. 38–40, findings 8–11). As the dissenting opinion pointed out: "[a]ny pocket that was going to serve as a [ballast]

tank would have to trap some water on the down roll, that would stay in place on the up roll, and it does not seem to me it takes any great inventive genius to discover that the way to accomplish this is to put the water access ports high on the side of the pocket. Anyone who did not see this would put the spout on the bottom of a teakettle, if he had a chance." (App. A., p. 32).

The only new feature of the Taylor canopy is the angle of inclination of the supporting poles. But, as the dissenting judges again correctly stated, "the support of a canopy by outward inclining poles is familiar to anyone who had ever attended a Barnum & Bailey circus. * * * The principles of physics involved would become intuitively understood * * * by anyone who had to deal with awnings, canopies, tents, spars, fabrics and ropes." (App. A., p. 33). Cf. *Knapp* v. *Morss*, 150 U.S. 221 (holding invalid a patent which applied the principle of the umbrella to a skirt form); *Morgan Envelope Co.* v. *Albany Perforated Wrapping Paper Co.*, 152 U.S. 425 (holding invalid a patent on an oval rather than cylindrical toilet paper roll, to facilitate tearing off strips).

The new twist in the Palmer patent was the notion that the ballast bag could be filled and emptied for convenience.[3] Placing the battery-operated lamp atop the "bean-bag" was not patentable since both elements were widely known and their combination rep-

[3] Like any other idea, the idea (apart from its embodiment) that the ballast bag would normally be empty is, of course, not itself patentable. *Westinghouse* v. *Boyden Power Brake Co.*, 170 U.S. 537, 556; *Le Roy et al.* v. *Tatham et al.*, 63 U.S. 132, 136.

resented "only the skill of the practiced artisan." *Bellow* v. *Park Sherman Co.*, 131 F. 2d 599 (C.A. 7), certiorari denied, 318 U.S. 765 (patent on a "bean-bag" ashtray held invalid). No more skill was required to draw the obvious analogy between adding and removing ballast in this case and inflating and deflating any number of products which are used when filled with air.

In *Palmer* especially, as well as in *Garrett*, the Commissioner pointed out that the government had used the patented article in significant numbers (App. B., p. 62; App. A., p. 29). Under *Graham*, however (as the Commissioner recognized), copying and commercial success are secondary considerations. 383 U.S. at 17–18. Indeed, this Court has held invalid patents on some extremely successful articles. See *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.*, *supra*, 396 U.S. at 61; *A. & P. Tea Co.* v. *Supermarket Corp.*, 340 U.S. 147, 153. And, of course, the mere existence of copying does not show patentability. See *Sears, Roebuck & Co.* v. *Stiffel Co.*, 376 U.S. 225, 230.

2. We recognize that this Court cannot consider on the merits every case in which it appears that the standard of patentability has been misapplied. However, where the departures from that constitutional standard are as egregious as in the present cases, the standard itself tends to become meaningless unless this Court affords review. The standard of invention is, after all, not susceptible of absolute clarification by abstract verbal formulations, and necessarily absorbs meaning through its application by the courts—and especially by this Court. See *Graham*, 383 U.S. at 18.

Moreover, review by this Court is doubly important where, as here, the decisions appear to represent a trend toward erosion of that standard by one lower federal court whose approach conflicts with that of other federal courts. A comparison of the decisions in patent suits of the Court of Claims and of other federal courts since *Graham* suggests this is the case.

In two instances since *Graham*, the Court of Claims has upheld patents which subsequently have been held invalid by another federal court in the face of the Court of Claims ruling. *Blumcraft of Pittsburgh* v. *United States*, 372 F. 2d 1014 (Ct. Cls.), involved a design patent on a railing. Plaintiff's design supported multiple rails with inconspicuous connectors. The prior art taught support of multiple rails with prominent connectors and single rails with inconspicuous ones. The Court of Claims held: "The mere fact that all the elements of a design may be individually old does not prevent a design from being patentable. * * * That there is but a simple regrouping of old elements does not negative design invention, * * *." 372 F. 2d at 1017. The Court of Appeals for the Fourth Circuit held the patent invalid two years later, stating: "The joining of known components usually requires skill, but this does not necessarily negate obviousness." *Blumcraft of Pittsburgh* v. *Citizens & Southern National Bank*, 407 F. 2d 557, 559.

In *Stukenborg* v. *United States*, 372 F. 2d 498, the Court of Claims held valid a patent on a turnbuckle assembly which is used to interconnect cables, wires, or rods so that their length and tension may readily

be adjusted. The assembly consists of three elements: a hollow band, end pieces, and a wire locking clip. The only difference between the patented turnbuckle assembly and that disclosed by the prior art was in the shape of the wire clip. (See 372 F. 2d at 500, figure 1.) A district court later held that this substitution of an improved clip in an old combination to accomplish the same result did not give plaintiff a right to a patent monopoly on the combination. *Stukenborg* v. *Teledyne, Inc.*, 299 F. Supp. 1152 (C.D. Calif.).

A marked difference in the percentage of patents held valid in the Court of Claims and in the courts of appeals since *Graham* also tends to suggest that different standards are being employed. See App. C, pp. 77–79, *infra*. In 22 post-*Graham* cases in the Court of Claims involving 45 patents, 27 (or 60 percent were held valid. By contrast, in a survey of cases decided in the courts of appeals from the date of the decision in *Graham* to December 1, 1968, it was found that only 27.9 percent of a total of 179 patents adjudicated were held valid (App. C. pp. 78–79, *infra*).

Each case must of course be considered on its merits. We do not undertake to demonstrate that any of the decisions of the Court of Claims upholding patent validity is wrong or that the two conflicting decisions of other federal courts were right. What we do contend is that the examples of disparities suggest that some undertaking of appellate review of Court of Claims decisions in this area is appropriate, at least where the Court's error is as egregious as we believe it was in the present cases.

3. The government has a strong financial interest in maintaining the standard of patentability in the Court of Claims. Under 28 U.S.C. 1498, all infringement suits against the United States must be brought in the Court of Claims. At the present time, 71 such actions are pending in that court, with an estimated potential liability between $250 million and $500 million. And, of course, administrative settlements of patent claims is influenced by the government's and the claimants' estimates of how the claimants would fare in the Court of Claims.

The government also is concerned about the effect of a lax standard of patentability on competition. As this Court recognized more than eighty years ago in striking down a patent for want of invention, "an indiscriminate creation of exclusive privileges" impairs technological progress and obstructs the economy. *Atlantic Works* v. *Brady*, 107 U.S. 192, 200. In furtherance of these considerations, the government, in 1958, abandoned its prior policy of giving preference in the award of contracts to patent owners, regardless of its appraisal of the validity of the patent. Of course, the holder of a valid patent still has an advantage in bidding, since other bidders must include a figure for royalties in their bid. Application of a lax standard of patentability by the Court of Claims, however, compels bidders to account for more royalties in their bids or, alternatively, forces the government to weigh the existence of patents held by one bidder when a royalty figure is not included by the others. The practical effect is that, in more cases than should be

necessary, the government's procurement system will be no more competitive than the system that existed prior to 1958.

CONCLUSION

The petition for a writ of certiorari should be granted.

Respectfully submitted.

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SEPTEMBER 1970.

In the United States Court of Claims

No. 312-65

(Decided February 20, 1970)

THE GARRETT CORPORATION *v.*
THE UNITED STATES

Wayne L. Benedict, attorney of record, for plaintiff. *James P. Burns, Robert S. Swecker*, and *Burns, Doane, Benedict, Swecker & Mathis*, of counsel.

Vito J. DiPietro, with whom was *Assistant Attorney General William D. Ruckelshaus*, for defendant.

Before COWEN, *Chief Judge*, LARAMORE, DURFEE, DAVIS, COLLINS, SKELTON and NICHOLS, *Judges*.

OPINION

PER CURIAM: This case was referred to Trial Commissioner James F. Davis with directions to make findings of fact and recommendations for conclusions of law under the order of reference and Rule 57(a) [since September 1, 1969, Rule 131(b)]. The commissioner has done so in an opinion and report filed on June 23, 1969. Exceptions to the commissioner's findings and recommended conclusion of law were filed by defendant. Plaintiff filed no exceptions and urged that the recommended conclusion of law be adopted by the court. The case has been submitted to the court on the briefs of the parties and oral argument of counsel. Since the court agrees with the commissioner's opinion, findings and recommended conclusion of law, as hereinafter set forth, it hereby

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adopts the same as the basis for its judgment in this case.* Therefore, it is concluded and held that claims 2, 5, and 6 of the Walker patent (U.S. Patent No. 2,914,799) are invalid and claim 3 thereof is valid and infringed and further that claims 1–3 of the Taylor patent (U.S. Patent No. 2,804,633) are valid and infringed. Plaintiff is entitled to recover reasonable and entire compensation for unauthorized use by defendant of these valid and infringed patent claims and judgment is entered for plaintiff accordingly with the amount of recovery to be determined pursuant to Rule 131(c)(2). All claims asserted in the petition, other than those for which plaintiff is held to be entitled to recover, are dismissed.

OPINION OF COMMISSIONER

DAVIS, *Commissioner:* This is a patent suit under 28 U.S.C. § 1498 to recover "reasonable and entire compensation" for alleged unauthorized use by the government of inventions disclosed and claimed in two patents owned by plaintiff. Only the issue of liability is before the court; accounting, if any, is deferred to later proceedings. The patents in suit relate to inflatable life rafts. No. 2,914,779 (the "Walker" patent) discloses a boarding ramp to assist survivors in the water to board the raft. No. 2,804,633 (the "Taylor" patent) discloses improved structure for mounting and supporting a canopy over the raft. Plaintiff contends that claims 2, 3, 5, and 6 of the Walker patent and claims 1–3 of the Taylor patent are infringed by a government-procured raft designated type F–2B, made by the Patten Company, Lake Worth, Florida, in accordance with two military specifications.

The issues before the court are patent validity under 35 U.S.C. §§ 102, 103, and 116, and patent infringement. Defendant contends that claims 2 and 3 of Walker are invalid under §§ 103 and 116; that claims 5 and 6 are invalid under §§ 102(b) and 103; and that none of claims 2, 3, 5, and 6 are infringed, even if valid. Defendant further contends that claims 1–3 of Taylor are invalid under §§ 102 (a) or (b) and 103, and that claim 3 is not infringed. Defendant concedes that Taylor claims 1 and 2 are infringed, if valid.

*The dissenting opinion of NICHOLS, *Judge*, in which SKELTON, *Judge*, joins, follows the opinion of the trial commissioner which has been adopted by the court.

WALKER PATENT

Walker describes a boarding ramp for use in conjunction with an inflatable life raft. The life raft, admittedly old, consists of two superposed inflatable tubes with a fabric floor in between. The tubes encircle the floor to form an occupant-receiving space. The boarding ramp comprises a pair of inflatable tubes, called in the patent specification "structural beams," which are attached in cantilever fashion to the raft. The beams extend outward horizontally from the raft parallel to each other and are connected together across their tops by impervious fabric to form a deck-like surface to which is attached handles for grasping by a survivor in the water. The ramp provides a rigid, buoyant structure at water level by which survivors are supported and assisted into the raft.

In one embodiment of the ramp, the deck fabric extends around the outboard end of the beams and is turned up and secured to the underside of the deck to form a water ballast pocket at the end of the ramp. The pocket has ports underneath the deck near the deck surface and above the normal water line of the ramp. Water thus enters the ballast pocket only when the end of the ramp is submerged sufficiently to lower the ports below water level. The patent specification says

> When the ramp is boarded from the water the free end of the beams * * * will yield slightly so that the upper surface of the deck member will be substantially at water level. When the ramp is in this position the ports * * * will be below the normal or average water line and water will flow through the ports into the water ballast pocket * * *. * * * The ports * * * are intentionally located above the normal water line * * * when the boarding ramp is unoccupied so that a larger quantity of water will be maintained in the pocket * * *. Thus, this boarding ramp, while functioning to facilitate entry onto the life raft * * *, additionally functions to provide stability to the entire raft.

Claims 2, 3, 5, and 6 are set out in finding 6. In essence, claims 5 and 6 define the ramp (*i.e.*, the structural beams covered by fabric deck) in combination with an inflatable

life raft. Claim 2, similar to claims 5 and 6, further recites the water ballast pocket which the claim says causes the ramp "to function as an outrigger and provide stability to the life raft." Claim 3, similar to claim 2, defines the water ballast pocket as having "access means located above the normal water line when the ramp is unoccupied for admitting water to said pocket."

Validity of claims 5 and 6

Defendant says claims 5 and 6 are invalid as anticipated under 35 U.S.C. § 102(b) by a document (hereafter the "British report") entitled "Boarding of Large Inflatable Dinghies from the Water," prepared in 1949 by V. N. Drake for the Marine Aircraft Experimental Establishment, a British Government agency. The British report, not considered by the Patent Office during prosecution of Walker's patent application, is a summary including drawings and photographs of work done in Great Britain up to 1949 to develop boarding devices for large life rafts. Among other things, the report discloses a boarding ramp for use with inflatable life rafts, comprising a pair of inflatable beams secured to a life raft and extending outwardly therefrom in horizontal plane at water level. A fabric apron is stretched across the beams and is fastened to their tops to form a deck. Between the beams at their outer ends is a so-called thwart, which is simply a small diameter inflatable tube connecting together the beam ends.

The British report describes tests of the boarding device, noting that it was "an extremely stiff appendage"; that "the rigidity of its outer end was quite surprising"; that "boarding proved to be fully as easy as previously"; but cautioning that "attachment [to the raft] needs to be very strong" to avoid damage by heavy weather. The report further noted that at tests, the device "started to tear apart from the main beam," probably due to "incomplete curing of the rubber solution" used to cement the device to the raft.

Plaintiff challenges the British report as anticipatory prior art on two grounds: (1) It is not a "publication" within the meaning of 35 U.S.C. § 102(b) because "it was not made available to the public more than one year before the filing date of the Walker patent application [filed December 9,

1955], and (2) even if statutory prior art, the report fails to anticipate because it teaches nothing more than an "abandoned unsuccessful experiment" which was an "admitted failure." Neither contention has merit.

To be a "publication" under the statute, a document must, among other things, be accessible to the public.[1] *Badowski* v. *United States*, 143 Ct. Cl. 23, 164 F. Supp. 252, 118 USPQ 358 (1958); I ROBINSON, PATENTS, §§ 325–27; I WALKER, PATENTS, § 60, at 272–77 (Deller's 2d ed. 1964). The public, for purposes of the statute, constitutes that class of persons concerned with the art to which the document relates and thus most likely to avail themselves of its contents. *Jockmus* v. *Leviton*, 28 F. 2d 812 (2d Cir. 1928); *Camp Bros.* v. *Portable Wagon Dump & Elevator Co.*, 251 F. 603 (7th Cir. 1917), *cert. denied*, 248 U.S. 572 (1918); *I.C.E. Corp.* v. *Armco Steel Corp.*, 250 F. Supp. 738, 148 USPQ 537 (S.D. N.Y. 1966). Factors bearing on whether a document was published include the number of copies made, availability, accessibility, dissemination, and even intent. *In re Tenney*, 254 F. 2d 619, 117 USPQ 348 (CCPA 1958).

About 80 copies of the British report were distributed in Great Britain prior to 1955 to various British Government agencies, American Government personnel in Great Britain, and 6 commercial companies. The report was unclassified and unrestricted in its use. While distribution to government agencies and personnel alone may not constitute publication (*Ex parte Suozzi*, 125 USPQ 445 (P.O. Bd. App. 1959)), distribution to commercial companies without restriction on use clearly does. Also pertinent is the fact that after 1950, the report was made available for dissemination in the United States through the Defense Department to government contractors who were advised of its availability and could obtain copies upon request at no cost. Coupled with distribution in Great Britain, evidence of availability in the United States to an interested segment of the public shows intent to make the contents of the report freely accessible. *In re Tenney*, *supra*; *Hamilton Laboratories, Inc.* v. *Massengill*, 111 F. 2d 584, 45 USPQ 594 (6th Cir. 1940), *cert. denied*, 311 U.S. 688. *See also* T. L. Crisman,

[1] It must also be "printed," but that is not an issue here.

In-House Publications—Can They Endanger Rights in Technical Information? 49 J. PAT. OFF. SOC'Y 549 (1967).

Therefore, the British report was a "publication" within the meaning of 35 U.S.C. § 102(b), and it is statutory prior art with respect to the Walker patent.[2]

Plaintiff's argument that the British report is not anticipatory because it teaches an "abandoned unsuccessful experiment" is misplaced. That argument bears on the question of prior public use, a defense not here asserted. *See Thacher* v. *Inhabitants of Town of Falmouth*, 235 F. 151, 158 (D. Me. 1916), *aff'd*, 241 F. 869 (1st Cir. 1917). A publication anticipates if it discloses all the elements of the claimed invention, or their equivalents, functioning in substantially the same way to produce substantially the same result, and if it teaches sufficient information to enable one skilled in the art to practice the invention. *International Glass Co.* v. *United States*, 187 Ct. Cl. 376, 408 F. 2d 395, 161 USPQ 116 (1969); *Thacher, supra;* I WALKER, PATENTS, § 60, at 277–80 (Deller's 2d ed. 1964). The British report clearly meets these criteria. It teaches an inflatable life raft in combination with a boarding ramp having all the elements recited in claims 5 and 6, and the elements function in substantially the same way to produce substantially the same result.[3]

Test problems noted in the British report in no way diminish its anticipatory value. The problems relate to fastening the ramp to the raft, not to the raft structure and design per se; and the problems' solution, within ordinary skill in the art, was even suggested in the report. (See finding 10.)

Claims 5 and 6 therefore are invalid under 35 U.S.C. § 102(b).

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[2] Defendant proved distribution of the British report in Great Britain by evidentiary deposition of a British Government employee, L. N. Green, who at one time was charged with disseminating technical documents and was familiar with recordkeeping practices of his agency. Though Green had no personal knowledge of distribution, he authenticated official records which were probative and reliable to establish that, in the ordinary course of business, distribution was made. 28 U.S.C. § 1732(a). *See also Bridger* v. *Union Ry. Co.*, 355 F. 2d 382, 391 (6th Cir. 1966).

[3] The ramp of the British report has an additional element not recited in the claims, viz. the thwart connecting the ends of the structural beams. The thwart adds some buoyancy to the ramp and provides lateral stability, but does not change its essential operating features.

Validity of claims 2 and 3

Defendant says claims 2 and 3 are invalid under 35 U.S.C. § 103, which requires that the invention be unobvious to one of ordinary skill in the art at the time it is made. Resolution of this issue requires factual analysis of (1) the scope and content of the prior art, (2) the differences between the prior art and the claims in issue, and (3) the level of ordinary skill in the pertinent art. *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966); *Martin-Marietta Corp.* v. *United States*, 179 Ct. Cl. 70, 373 F. 2d 972, 153 USPQ 206 (1967).

As prior art, defendant relies on the British report, above discussed, and in addition, documents which show that it was old at the time the invention in suit was made to use water ballast pockets on inflatable life rafts to increase stability. A U.S. Army specification in 1944, entitled "Raft, Pneumatic, Type A3A," called for water ballast pockets on each side of the raft, secured underneath the buoyancy tube and below the normal water level of the raft. Thus, the pockets filled with water immediately when the raft was put afloat and remained filled as long as the raft was in upright position. The ballast pockets stabilized the raft by minimizing drift and by resisting overturn. More particularly, the pockets, protruding into the water, helped retard horizontal movement of the raft by wind or waves; and if the raft started to capsize, a pocket, as it was pulled out of the water, weighed down on the raft so to resist overturn. Because wholly submerged, however, the pockets added no weight to the raft when in normal upright position. The British used similar ballast pockets on inflatable rafts at least as early as 1953, and one writer noted that the pockets helped make the rafts "extremely stable."

Plaintiff's water ballast pocket, unlike the prior art, is located on the ramp (rather than under the raft) and is not wholly submerged. It fills with water as the ramp end is lowered during boarding; and once filled, some of the water in the pocket remains above the ramp water line, thus adding weight, and hence stability, to the raft in its normal upright position.

Patent claims are the measure of the invention. *Continental Paper Bag Co.* v. *Eastern Paper Bag Co.*, 210 U.S. 405, 409

(1908); *White* v. *Dunbar*, 119 U.S. 47, 51 (1886). To be valid, claims must define the invention with sufficient particularity to distinguish over the prior art and all obvious modifications thereof. *In re Cornish*, 277 F. 2d 185, 188, 125 USPQ 413, 415 (CCPA 1960); *In re Lillich*, 245 F. 2d 471, 114 USPQ 291 (CCPA 1957); *Minnesota Mining & Mfg. Co.* v. *Projection Optics Co.*, 256 F. Supp. 351, 362, 150 USPQ 33, 39 (W.D. N.Y. 1966). Claim 2 recites broadly the combination of the raft, boarding ramp and water ballast pocket at the end of the ramp. So defined, claim 2 reads on the combination of a raft-ramp of the British report and a water ballast pocket as taught by the prior art, the only difference being the location of the ballast pocket—on the ramp rather than the raft. Plaintiff says this difference is not obvious because placing the ballast pocket on the ramp, rather than the raft, provides greater stability against overturn. However, the prior art shows that ballast pockets were always placed as far outboard on rafts as practicable to provide maximum stability against overturn; plaintiff's structure, as recited in claim 2, simply uses the same principle in an obvious way.

Claim 3, however, is a different matter. Unlike claim 2, it includes the limitation of access ports in the ballast pocket above the normal water line, a difference not taught or suggested by the prior art. The difference is significant because, as above noted, it permits a substantial part of the water in the pocket to remain above the normal water line of the raft and thus, unlike prior art ballast pockets, adds weight (and hence stability) to the raft.[4]

Bearing on the question of obviousness of placing access ports above the water line is a letter dated March 4, 1957, from L. E. Caldwell, engineering manager of Air Cruisers Company, a division of plaintiff, to J. T. Eubanks of plaintiff's patent department. Caldwell's letter apparently was in answer to queries by Eubanks about the correctness of locat-

[4] The quantity of water in the ballast pocket above the water line of the ramp and raft depends, of course, on the load in the raft. When fully loaded, the raft rides lower in the water than when empty; and perhaps, when the raft is fully loaded, little, if any, of the water in the ballast pocket is above the water line. However, stability is most critical when the raft is not fully loaded, and it is then that the extra water in the pocket is most needed and effective.

ing access ports above the normal water line. The letter noted (emphasis added):

> The location of the inlet ports of the water ballast pocket * * * are [*sic*] *correctly* shown on drawing 3617 [corresponding to Walker patent Fig. 4]. * * * These holes were located above a normal or average water line *intentionally* so a larger quantity of water would be maintained in the pocket.

Later, during prosecution of the Walker patent application, the patent examiner also questioned the placement of access ports "above the water line." A similar explanation was made to the Patent Office and the patent specification so amended. The clear inference is that neither plaintiff's patent attorney nor the patent examiner recognized why access ports were located above the water line; and this is persuasive indicia of unobviousness.

In sum, the structure defined by claim 3 is not taught or suggested by the prior art; it provides a significant and unobvious difference over the prior art; and it is thus patentable under 35 U.S.C. § 103.

Defendant says claims 2 and 3 are invalid under 35 U.S.C. § 116 which requires that patent applications filed on inventions made "by two or more persons jointly" shall include the signature and oath of each inventor. Defendant contends that Robert Bicknell, a fellow-employee of patentee Walker, was a joint inventor of claims 2 and 3. The record shows that Walker and Bicknell were coworkers on a life raft project at Air Cruisers Company at the time the invention in suit was made. On February 14, 1955, Walker submitted to plaintiff an invention disclosure describing a boarding ramp essentially as shown in Figs. 1–3 of the Walker patent. The disclosure did not describe the water ballast pocket in combination with the boarding ramp (Walker patent Fig. 4). Later, Walker augmented his disclosure to add the water ballast pocket, noting in a memorandum that Robert Bicknell had suggested the idea. The memorandum referred to a drawing made by Walker which showed the construction details of the ballast pocket, particularly the placement of water access ports. Bicknell testified he could not remember suggesting the ballast pocket idea to Walker.

The burden of showing misjoinder or nonjoinder of inventors is a heavy one and must be proved by clear and convincing evidence. *Porter-Cable Machine Co.* v. *Black & Decker Mfg. Co.*, 274 F. Supp. 905, 913, 155 USPQ 491, 498 (D. Md. 1967); *aff'd*, 402 F. 2d 517, 159 USPQ 65 (4th Cir. 1968), *cert. denied*, 383 U.S. 1063 (1969). Joint invention connotes collaboration of effort to produce a complete and operative invention. One who merely suggests an idea of a result to be accomplished, rather than means of accomplishing it, is not a joint inventor. *Forgie* v. *Oil-Well Supply Co.*, 58 F. 871 (3d Cir. 1893); *Worden* v. *Fisher*, 11 F. 505 (E.D. Mich. 1882). Focusing on claim 3,[5] the most that can be said on this record for Bicknell's participation in the inventive effort is that he apparently suggested the broad idea of a water ballast pocket for use in conjunction with a boarding ramp, an idea held above to be obvious in view of the prior art. Since Bicknell disclaims knowledge of even that much participation, we infer that he had nothing to do with the further unobvious, and more refined, concept of placing access ports above the water line. Walker made the drawing showing the ballast pocket structure, including the access ports, and apparently was solely responsible for construction details which made the device complete and operable. Accordingly, claim 3 defines a sole invention of Walker.

Infringement of claim 3

Infringement is made out if an accused device uses the same means functioning in substantially the same way to accomplish substantially the same result. *Badowski* v. *United States*, 135 Ct. Cl. 93, 140 F. Supp. 544, 109 USPQ 293 (1956); *Barrett* v. *United States*, 186 Ct. Cl. 210, 405 F. 2d

[5] Since claim 2 is invalid for obviousness, the question of inventorship of its subject matter is moot. However, if not obvious, claim 2 presents an irreconcilable dilemma on inventorship. Walker made oath in his patent application that he was the sole inventor of the subject matter of claim 2. At trial, he testified otherwise, and his memorandum of March 28, 1955 supports the testimony. Thus, either (1) Walker and Bicknell are joint inventors of claim 2, or (2) Bicknell was sole inventor. On this record, Bicknell cannot be a joint inventor since he disclaims knowledge of joint participation and thus cannot make oath to joint inventorship so to correct the patent under 35 U.S.C. § 256. Nor has plaintiff sought correction. *A fortiori*, Bicknell is not a sole inventor; and even if he were, the patent could not be corrected because no proper inventor was named *ab initio*. *Kochring Co.* v. *E. D. Etnyre & Co.*, 254 F. Supp. 334, 359, 149 USPQ 263, 284 (N.D. Ill. 1966), and cases cited therein.

502, 160 USPQ 224 (1968). The government's F–2B raft responds in terms to claim 3. Defendant does not contend otherwise. However, defendant denies infringement on the narrow ground that the end of the ramp on the F–2B does not remain "substantially at water level" when boarded and thus does not function like the patented device. Defendant also says plaintiff is precluded under the doctrine of file wrapper estoppel from applying the claim to its raft. Both arguments are groundless.

The dispute revolves around the phrase in claim 3 and in the specification "substantially at water level" which defendant says means "the ramp * * * does not sink into the water below the point where the water level would be tangent with the uppermost surface of the ramp ends." We think this is too narrow a view and inconsistent with the intent and reasonable construction of the specification and claims. During trial, the parties conducted tests of the F–2B raft, fully documented in the record by photographs. (See finding 16.) The ramp on the F–2B remained essentially horizontal during boarding and thus "substantially at water level" within the meaning of the patent. Admittedly, the outboard end of the ramp submerged momentarily during boarding under the weight of the boarder; but this was contemplated in the patented structure whose "free end of the beam" was intended to "yield slightly."

The defense of file wrapper estoppel is not appropriate in this case. It is a doctrine which prohibits patentees from construing claims inconsistent with limitations added during Patent Office prosecution to distinguish over prior art. *Exhibit Supply Co.* v. *Ace Patents Corp.*, 315 U.S. 126, 52 USPQ 275 (1942); *Autogiro Co. of America* v. *United States*, 181 Ct. Cl. 55, 384 F. 2d 391, 155 USPQ 697 (1967). Plaintiff here attempts no such construction. During Patent Office prosecution, claim 3 was amended to say that the structural beams, which form the support members of plaintiff's boarding ramp, have "sufficient rigidity and buoyancy when inflated to maintain the free end of the ramp substantially at water level when the ramp is boarded from the water." The limitation was added to distinguish over a prior art device (shown in a British patent to Albrecht, finding 9) which submerged completely during the boarding process

to form an inclined ramp under water. By so limiting the claim, it is assumed plaintiff did not intend to narrow its scope any more than necessary to distinguish over the art. *Hunt Tool Co. v. Lawrence*, 242 F. 2d 347, 354; 113 USPQ 7, 12 (5th Cir. 1957), *cert. denied*, 354 U.S. 910. No doubt plaintiff is estopped to read claim 3 on a device like Albrecht. However, defendant's device is not like Albrecht's but rather is identical to plaintiff's, and it functions in substantially the same way.

Claim 3 therefore is infringed.

TAYLOR PATENT

Taylor discloses a structure for supporting a canopy over an inflatable life raft. Fully described in finding 17, the structure comprises in essence short posts supported by and spaced around the inside upper perimeter of the raft buoyancy tube. The posts incline outwardly of the raft at about a 45° angle and are held in position by tubular sockets and grommeted flaps which are fastened to the tube. Points around the outer edge of the canopy are attached to the top of the posts; and the canopy is thereby supported atop the raft much like a conventional tent. Near the bottom of each post is a U-shaped clip, permanently hinged to the post and called in the patent specification a "spring-wire, bail-like member." The clip swings underneath the bottom of the socket when the post is in place, thus holding the post secure in the socket and preventing inadvertent lengthwise movement up or down.

The patent specification says that the canopy structure has the following advantages: (1) Because the posts are not supported by the raft floor, they are short and thus more conveniently stowed with the raft in deflated condition; (2) the posts do not obstruct occupants of the raft; and (3) the outward inclination of the posts permits the canopy to extend over the raft tubes, like eaves, to provide better protection against sun and weather. Evidence at trial (discussed later) further established that fewer posts are necessary to support a canopy in the Taylor structure than in prior structures where the posts were vertical, rather than inclined.

Claims 1–3, set out in finding 18, define the canopy structure in combination with a life raft. Claim 1 is representative:

> 1. A life raft comprising
>
> a flexible-walled, fluid distensible buoyancy member of substantially circular cross-sectional shape,
>
> a canopy-supporting post, and
>
> means for supporting said post, wholly from said buoyancy member, in an outwardly inclined position, said means comprising
>
> post-holding means secured to the inboard side of the fluid distensible buoyancy member and wholly supported directly thereby.

Claim 2 defines the "post-holding means" as "an apertured fabric member" and a "molded rubber tubular member." Claim 3 adds the hinged clip, defined as "means for limiting endwise movement of the post."

Validity of claims 1–3

Defendant says claims 1–3 are invalid under 35 U.S.C. § 102(b) as anticipated by two prior art life rafts used by the government in the World War II era. Alternatively, defendant says the claims are invalid under 35 U.S.C. § 103 as defining an invention which is obvious within the meaning of the statute. The Navy used two life rafts in the mid-1940's, designated the Mark IV sailing raft and the AR–10 pneumatic boat, described in finding 21. The Mark IV was experimental; and it is not clear from the record to what extent it was procured and used. Likewise, the extent of procurement and use of the AR–10 is not clear. Both devices were essentially inflatable tube rafts, designed to hold 4 and 10 persons, respectively. Both had canopies and canopy-support structures. The support structures included posts secured around the inside lower perimeter of the buoyancy tube by means of sockets and apertured fabric flaps. The sockets and flaps were aligned to hold the posts vertical, rather than outwardly inclined. Defendant contends that the canopy structures of the Mark IV and AR–10 are "identical" to that defined in claims 1–3, with the "possible exception of the angle of inclination" of the support posts. The record is

clear that neither the Mark IV nor AR–10 show or suggest outward inclination of the canopy posts. Rather, the posts, if inclined at all, appear to have been inclined slightly inwardly, not outwardly, when supporting the canopy. The Mark IV and AR–10 therefore fail to anticipate claims 1–3.

Whether claims 1–3 define an invention obvious under § 103 requires analysis along the guidelines set out in *Graham* v. *John Deere Co.*, *supra*. The most pertinent prior art is the Mark IV and AR–10 rafts, neither of which was considered by the Patent Office during prosecution of the Taylor patent application. The structure of claims 1–3 differs therefrom only in the inclination of the canopy posts.[6] Defendant says this difference was obvious because it was "usual design practice" to provide an "outward inclination of the canopy posts," relying particularly on a patent to Hallward (finding 23), considered by the Patent Office, which shows outward inclination of canopy poles on a life raft totally unlike the raft in suit. Defendant also relies on British Patent No. 726,833 to show the level of ordinary skill in the art at about the time the invention in suit was made. *International Glass Co.* v. *United States*, *supra*. The British patent is not statutory prior art because it issued after the filing date of the Taylor patent.

Deciding obviousness is fraught with dangers of hindsight reasoning. Our point of departure therefore must be analysis of the history of art to see how those skilled in the art approached and solved problems. *Reiner* v. *I. Leon Co.*, 285 F. 2d 501, 128 USPQ 25 (2d Cir. 1960), *cert. denied*, 366 U.S. 929 (1961); *Ellicott Mach. Corp.* v. *United States*, 186 Ct. Cl. 655, 405 F. 2d 1385, 160 USPQ 753 (1969). The Mark IV and AR–10 represent early attempts to provide protective canopies over inflatable life rafts. Canopy support posts were vertical and were mounted and supported wholly on the inside of the inflatable tube. Because the posts were vertical, the weight of the canopy tended to bow and bend them inwardly at their tops and the canopy tended to sag. In the AR–10, tie-cords were fastened to the canopy edge and secured near the raft floor to help support the canopy. There

[6] Claim 3 also differs in reciting "means for limiting endwise movement of the post," i.e., the hinged clip. However, such difference is not crucial to deciding obviousness.

is no evidence that the Mark IV or the AR–10, or any other raft with vertical posts mounted wholly on the raft tube, were made the subject of a military specification. So far as the record shows, the Mark IV and AR–10 designs were abandoned.

About 1951, the art took a different course. The Air Force issued a military specification for a large, 20-man inflatable raft, designated F–2, in which the canopy was secured to 12 vertical posts, mounted on the raft floor rather than wholly on the inflatable tube. Because mounted vertically, the posts suffered the same tendency to bow and bend inwardly as did the Mark IV and AR–10. Nevertheless, the canopy structure remained unchanged from 1951 to 1957, through four revisions of the military specification.

In 1954, the patentees in suit came up with the idea of mounting the posts off the floor, high on the inside of the inflatable tube, and inclined about 45° outward from vertical, as shown in the Taylor patent drawing. By so doing, the posts were shortened and the weight of the canopy was made to act more along the longitudinal axes of the posts, thus reducing the bending moment and using more effectively the strength of the posts. The result was to reduce from 12 to 6 the number of posts needed to support the canopy on the government's 20-man raft. Fewer and shorter posts thus minimized the cost of the raft assembly and reduced its stowage weight by about 3 pounds. The new design was proposed to the Air Force by plaintiff in 1956, was adopted in 1957, and has been part of applicable military specifications ever since.

It would be an easy thing to say, as defendant urges, that plaintiff's canopy structure was but a slight and obvious modification of the Mark IV and AR–10. Indeed the change was a simple one; but often, as here, simple changes are unobvious when viewed in light of the history of the art. *Eibel Process Co.* v. *Minnesota & Ontario Paper Co.*, 261 U.S. 45 (1923). And it was a change from which flowed unexpected advantages in performance and cost as evidenced by its immediate adoption by the government. With respect to British Patent No. 726,833, cited to show the level of ordinary skill in the art, it does not teach inclined canopy posts but rather inflatable tubes, called "arched thwarts," to

support the canopy. Posts secured to the exterior of the main buoyancy tubes are used to hold open an "entry mouth" through the canopy. The British patent therefore does not show "near simultaneous invention" of the subject matter of the Taylor patent and thus is not pertinent within the meaning of the *International Glass* case. If anything, the British patent shows it was not obvious to those working in the art in the early 1950's to use canopy support posts, as described and claimed in the Taylor patent.

Plaintiff's canopy therefore was a substantial, unexpected and unobvious improvement over the prior art and was thus patentable under 35 U.S.C. § 103. *United States* v. *Adams*, 383 U.S. 39, 148 USPQ 479 (1966).

Infringement of claim 3

Defendant concedes infringement of Taylor claims 1 and 2, if valid, but denies infringement of claim 3. Claim 3 calls for "means for limiting endwise movement of the post in the tubular portion of the tubular member" which, as described in the patent specification, is the hinged clip for preventing inadvertent lengthwise movement of the post when in place. Defendant says it uses neither a hinged clip, nor its equivalent, to hold posts in the F-2R raft. Rather it uses an umbrella-type clip embedded in the post and positioned just under the apertured flap when the post is in place to prevent upward movement of the post; and it uses a socket, closed at its bottom end, to prevent downward movement of the post.

35 U.S.C. § 112 provides that "[a]n element in a claim for a combination may be expressed as a means * * * for performing a specified function without the recital of structure, * * * and such claim shall be construed to cover the corresponding structure * * * described in the specification and equivalents thereof." Plaintiff therefore is not limited to the specific structure shown in its patent specification for "limiting endwise movement of the post." *Stearns* v. *Tinker & Rasor*, 252 F. 2d 589, 597, 116 USPQ 222, 227 (9th Cir. 1957); *Chicago Pneumatic Tool Co.* v. *Hughes Tool Co.*, 97 F. 2d 945, 946, 38 USPQ 258, 259-60 (10th Cir. 1938), *cert. denied*, 305 U.S. 643. Rather it is entitled to a range of equivalent structures which perform the same function.

Defendant says, however, that its structure is not equivalent because the claim phrase "in the tubular portion" must be construed to mean "around the tubular portion"; and that accordingly the claim should be limited to devices like plaintiff's hinged clip which fasten around the socket to prevent movement of the post. There is nothing in the patent specification or the file history of the patent application supporting this view. Rather it seems clear that the "means" clause in question is entitled to broad construction to cover any means by which the post is confined substantially in the socket against inadvertent removal when in place. Defendant's umbrella-type clip and closed-end socket so-confine the post.

Finally, defendant says claim 3 is invalid, if construed so broadly as to be infringed, because the prior art teaches structure for confining posts in sockets in some respects similar to that used by defendant. For reasons above discussed with respect to claims 1 and 2, claim 3 is valid. It remains so irrespective of the breadth of construction of the final "means" clause. Claim 3 therefore is infringed.[7]

In sum: Claims 2, 5, and 6 of the Walker patent are invalid; claim 3 is valid and infringed. Claims 1–3 of the Taylor patent are valid and infringed.

NICHOLS, *Judge*, dissenting:

Respectfully I dissent, as I believe the court is making a mistake in adopting Per Curiam the commissioner's report, able as it is, without certain major modifications I deem to be necessary.

I would challenge the conclusions that claim 3 of U.S. Patent No. 2,914,779 (hereinafter, Walker patent), and claims 1–3 of U.S. Patent No. 2,804,633 (hereinafter, Taylor patent), are valid and infringed. Defendant says they are all obvious in view of prior art, and I agree.

In dealing with the Walker patent the commissioner wields a truly well honed scalpel, separating claim 3 from claim 2 which he holds obvious in view of prior art, and 5 and 6 which he says were anticipated. This means that the new invention of claim 3 is of exceedingly narrow scope: not the

[7] Two military specifications on the F–2B require hinged clips substantially identical to plaintiff's. There is no evidence that the government procured rafts with such structure; if procured, however, they clearly infringe.

device of the boarding ramp to enable swimming survivors to board the raft, nor the water ballast pocket at the ramp's end to stabilize it, but only the placement of the ports for access of sea water to the pocket.

I presume that these rafts would roll as the crests of ocean seas passed under them, communicating greatly enhanced up and down movement to the end of a light, stiff extension, such as the ramp is, whenever it happened to lie at a right angle to the waves. It would be snatched abruptly from the swimmer's hands, and then would slap down, perhaps beating him upon the head. The device of trapping some sea water at the end of the ramp, to act as ballast, certainly looks like a valid answer, but it is not new, the commissioner tells us. This much being decided upon, it would certainly seem obvious that on the upward roll of the ramp, the ballast water would flow out and not serve its purpose, if the access ports were at the bottom. Any pocket that was going to serve as a tank would have to trap some water on the down roll, that would stay in place on the up roll, and it does not seem to me it takes any great inventive genius to discover that the way to accomplish this is to put the water access ports high on the side of the pocket. Anyone who did not see this would put the spout on the bottom of a tea kettle, if he had a chance. It is evident, also, that trapped air would obstruct the entry of water if the ports were low down. On the other hand, the conditions that made the ballast needful, *i.e.*, heavy rolling, would thrust the ramp end under water at the low extremity of the roll, so the pocket would have water in it even before the first swimmer tried to come aboard. If the prior art water ballast pocket did not use something like this idea to trap the water I simply cannot imagine how it was of any use at all. It seems to me that anyone seeking to use the invalid claim 2 to guide him in building a life raft with boarding ramps using water ballast pockets at their ends, would inevitably design the pockets in such a way that they trapped water, and if they did they would be indistinguishable in principle from the pockets of claim 3.

Thus the commissioner's distinction between claims 2 and 3 I deem to be an excess of refinement and contrary to the Congressional reports quoted with approval in *Graham* v. *John Deere Co.*, 383 U.S. 1, 14 (1966):

> * * * An invention which has been made, and which is new in the sense that the same thing has not been made before, may still not be patentable if the difference between the new thing and what was known before is not considered sufficiently great to warrant a patent. * * *

The Taylor patent teaches a way to make the canopy of such a life raft more extensive in horizontal area. Such canopies, of course, are to protect survivors from the effects of the sun and rain in case rescue is not immediate. On the prior art raft the canopy is attached to vertical poles socketed to the inside circumference of the upper circular flotation tube and the raft floor. The canopy sags loosely and therefore must have flapped distressingly in any breeze, yet it is small in relation to the size of the raft. It would not have been probable that such a defective canopy could have been tolerated very long except that, no doubt, the attention of raft designers was focussed on more essential structural features.

The Taylor invention angles the poles outward, fastening them to the tube only, not the floor. Thus the circumference of the canopy is larger, approximating the outer circumference of the raft, giving an "eaves effect." A spray shield can be kept rolled up around the canopy circumference, or let down and fastened in the "crotch" of the inflatable tubes. In the latter state it would seemingly act as a guy, further stiffening the canopy, but even with it up, the outward incline of the posts reduces the bending moment on them and uses their strength more effectively.

It would, I think, have been obvious to anyone that the prior art canopy was defective and needed improvement as soon as more essential difficulties with the design were deemed overcome. As to how improvement might come, the support of a canopy by outward inclining poles is familiar to anyone who ever attended a Barnum & Bailey circus. With its weather cloth down the involved canopy would appear substantially the same in structure as a circus tent. The principles of physics involved would become intuitively understood, I think, by anyone who had to deal with awnings, canopies, tents, spars, fabrics and ropes. I have a lot of difficulty imagining that anyone who recognized the prior art canopy as defective would not think of trying outward in-

clination of poles as a remedy. Defendant has, indeed, pointed to the Hallward patent drawings where canopy poles do incline outward but which the commissioner distinguishes on the dubious ground that the raft there patented is not of the inflatable type. This overlooks the fact that inflatable rafts are vessels, just as noninflatable ones are. *Thornley & Pitt, et al.*, v. *United States*, 48 Cust. Ct. 134 (1962). They are subject to the same laws of physics that govern other vessels. This is not a case of a device having developed in one sphere of activity and being adopted in another one, completely different. I would not dispute that patentable invention might exist in such a case, because persons skilled in one art might not be aware of developments in another wholly distinct one.

I would dismiss the action because the inventions, after cutting away what was anticipated, represent advances on the prior art which are too small for notice under the patent laws, and would be tried by anyone who recognized the defects of prior art and wanted to experiment with the obvious means of correcting them.

SKELTON, *Judge*, joins in the foregoing dissenting opinion.

FINDINGS OF FACT

1. This is a patent suit under 28 U.S.C. § 1498. Plaintiff seeks reasonable and entire compensation for unauthorized use by defendant, the United States, of the inventions disclosed and claimed in two U.S. patents: (a) No. 2,804,633, entitled "Inflatable Life Raft Comprising Improved Canopy and Supporting Means Therefor," issued to plaintiff on September 3, 1957, on an application filed July 15, 1954, by Robert J. Fraebel and Myron L. Taylor; and (b) No. 2,914,779, entitled "Boarding Ramp," issued to plaintiff on December 1, 1959, on an application filed December 9, 1955, by Alan B. Walker. Plaintiff's petition was filed in this court on August 30, 1965.

2. Plaintiff is a California corporation with its principal place of business in Los Angeles, California, and is sole owner of the patents in suit.

3. The issues before the court are patent validity under 35 U.S.C. §§ 102, 103 and 116, and patent infringement. The parties have agreed to defer trial on the accounting issue, if

any, until a ruling by the court on the issues of validity and infringement.

4. The patents in suit relate to inflatable life rafts having a pair of superposed inflatable tubes with a fabric floor or deck therebetween. The tubes encircle the deck to form an occupant-receiving space. The raft is reversible, *i.e.*, will function with either side down to the water. The '779 patent (hereafter the "Walker patent") relates to a boarding ramp to assist persons in the water to board the raft. The '633 patent (hereafter the "Taylor patent") relates to an improved means for mounting and supporting a canopy over the raft.

THE WALKER PATENT

5. The Walker patent describes a boarding ramp, for use with an inflatable life raft, comprising a pair of parallel-disposed inflatable tubes, called in the patent specification "structural beams," which are attached in cantilever fashion to the lowermost inflatable tube of the raft. The tubes or beams extend outward horizontally from the raft and are connected together across their tops by impervious fabric to form a deck-like surface to which is attached handles for grasping by a survivor in the water. In one embodiment of the ramp, the fabric is secured to the top of the beams and extends around their outboard ends for a short distance on the underside to form a chamber of entrapped air between the fabric deck and the water. In another embodiment, the fabric is extended further over the end of the beams, and is turned up and secured to the underside of the deck to form a water ballast pocket at the end of the ramp. The water ballast pocket has ports, underneath the deck and near the deck surface, through which water enters the pocket when the end of the ramp is submerged. The ports are above the normal water line of the ramp so that, once filled, the pocket retains water above the water line, thus adding weight to the ramp.

The patent specification says that the boarding ramp has, in essence, the following advantages over prior art devices: (1) The ramp, being rigid and buoyant, will support above the water level a survivor, who is perhaps exhausted or injured, and will in addition assist him in climbing into the raft; and (2) the ballast pocket, when filled with water, pro-

vides a stabilizing moment and acts as an outrigger to minimize the possibility of overturning the raft.

6. Claims 2, 3, 5, and 6, the only claims of the Walker patent in issue, are to the combination of the boarding ramp and the life raft, and are set out below:

> 2. A boarding ramp in combination with an inflatable life raft having inflatable buoyant means encircling an occupant-receiving space, said ramp including
>
> a deck member of impervious material,
>
> an inflatable supporting structure for said deck member comprising a pair of spaced inflatable structural beams attached at one end to, and communicating with, the inflatable buoyant means, said beams having sufficient rigidity and buoyancy when inflated to maintain the free end of the ramp substantially at water level when the ramp is boarded from the water, and
>
> a *water ballast pocket at the outer ends of the beams* to cause the ramp to function as an outrigger and provide stability to the life raft. (Emphasis supplied)
>
> 3. A boarding ramp in combination with an inflatable life raft having inflatable buoyant means encircling an occupant-receiving space, said ramp comprising, an inflatable supporting structure having a pair of spaced inflatable structural beams attached at one end to, and communicating with, the inflatable buoyant means, said beams having sufficient rigidity and buoyancy when inflated to maintain the free end of the ramp substantially at water level when the ramp is boarded from the water, and
>
> a deck member secured to the spaced inflatable structural beams along the entire upper side, around the free outboard ends thereof, and for a distance on the underside, the end of the deck member on the underside of the ramp being bent up and secured to form *a water ballast pocket at the outer ends of the beams* to cause the ramp to function as an outrigger and provide stability to the life raft, and
>
> *access means located above the normal water line* when the boarding ramp is unoccupied for admitting water to said pocket. (Emphasis supplied)
>
> 5. A boarding ramp in combination with an inflatable life raft having inflatable buoyant means encircling and defining in the inflated state a generally upstanding outer side wall at the perimeter of an occupant-receiving space, said ramp comprising

a plurality of inflatable structural beams attached at one end at horizontally spaced locations to and communicating with the inflatable buoyant means, said beams engaging said outer side wall of said buoyant means to extend in the inflated state outwardly substantially between the horizontal planes defining the upper and lower limits of said upstanding side wall and having sufficient rigidity and buoyancy when inflated to maintain the free end of the ramp substantially at water level when the ramp is boarded from the water, and

a deck member secured on the inflatable structural beams.

6. A boarding ramp in combination with an inflatable life raft having inflatable buoyant means encircling and defining in the inflated state a generally upstanding outer side wall at the perimeter of an occupant-receiving space, said ramp comprising

an inflatable supporting structure having a pair of spaced inflatable structural beams attached at one end at horizontally spaced locations to and communicating with the inflatable buoyant means, said beams engaging said outer side wall of said buoyant means to extend in the inflated state outwardly substantially between the horizontal planes defining the upper and lower limits of said upstanding side wall and having sufficient rigidity and buoyancy when inflated to maintain the free end of the ramp substantially rigid at water level when boarded from the water, and

a deck member comprising a sheet of fabric secured to the spaced inflatable structural beams.

Claims 5 and 6 differ from claims 2 and 3 principally in that they do not include the water ballast pocket.

7. Plaintiff contends claims 2, 3, 5, and 6 of the Walker patent are infringed by a government-procured raft designated type F-2B, made by the Patten Company, Lake Worth, Florida, in accordance with two military specifications: MIL-R-009131C(USAF), dated July 19, 1957, and MIL-L-009131D(Aer), dated October 6, 1959. The F-2B raft has two superposed inflatable tubes between which is a fabric deck or floor. The tubes encircle the deck. Two boarding ramps are attached on opposite sides of the raft and on different tubes so to make the raft reversible. The ramps comprise parallel-disposed inflatable beams which are inte-

gral with the tubes and inflate simultaneously therewith. A cloth apron is attached to the tubes and across their tops. Handles are affixed to the apron for grasping by persons in the water. The outboard end of the cloth apron is extended back under the beams to form a water ballast pocket. Three holes are provided near the top of the pocket toward the raft and above the normal water line of the ramp to admit water to the pocket when the ramp end is submerged. The cloth apron has three drain holes in its top.

The structure of the F-2B raft and boarding ramp is the same in all material respects as the raft and ramp described and claimed in the Walker patent and it operates in substantially the same way to produce substantially the same results.

8. Defendant put into evidence the following documents, among others:

(a) British Patent No. 634,271 to A. R. Albrecht (1950);

(b) British report No. F/Eq/304 of the Marine Aircraft Experimental Establishment (MAEE), entitled "The Boarding of Large Inflatable Dinghies from the Water," by V. N. Drake (1949);

(c) U.S. Army Specification No. 94-40420-A (1944);

(d) THE BRITISH MOTOR SHIP, at 104a (Dec. 2, 1955);

(e) G.W.R. Nicholl, *Survival at Sea*, MARINE ENGINEER AND NAVAL ARCHITECT, at 249-52 (June 1953);

(f) R. Bicknell, *Air Crew Survival*, report of Air Cruisers Company (Nov. 11, 1953).

Documents (a) and (d) were considered by the Patent Office during prosecution of the Walker patent application; the others were not.

9. The Albrecht patent, cited and relied on by the Patent Office as prior art during prosecution of the Walker patent application, teaches the combination of an inflatable life raft (or "dinghy") and an inflatable boarding ramp (called by Albrecht an "inflatable raft"). Albrecht's ramp, similar in appearance to a conventional air mattress, is attached to the lower tube of a double-tube inflatable life raft. The patent specification says that the ramp "may be of any convenient shape or form but is preferably provided with internal tie-cords or other means for preventing undue bulging of the upper surface when in the inflated condition." Otherwise,

the patent discloses no dimensions or detailed buoyancy characteristics of the ramp.

The patent drawings show schematically how the ramp assists a survivor in the water to board the life raft. The patent says the ramp provides

> buoyant support for a person wishing to board the vessel [life raft]. When the weight of the body is first placed on the edge of the inflated raft, that edge will be forced beneath the water level, the raft forming an inclined ramp up which the body can be dragged; suitable handholds are preferably provided at intervals along the length of the raft to facilitate this part of the operation. When the person has reached the side of the vessel with his hand the raft will have assumed more or less horizontal position in which it gives substantial support for the final operation of climbing over the side of the vessel.

10. British report No. F/Eq/304 (hereafter the "British report") discloses a boarding device for use with an inflatable-tube life raft. The device comprises a pair of inflatable beams secured to and integral with the inflatable tube of the raft. A fabric apron is stretched across the beams and is secured to their tops to form a deck or floor. The apron has six holes, reinforced around their circumference, to serve as hand holes for survivors climbing onto the device. The beams inflate independently of the raft tube and extend outward horizontally from the raft. Between the beams at their outboard ends is a so-called thwart, which is simply a small-diameter inflatable tube connecting together the beam ends.

The British report contains drawings and photographs of the device, above described, and states that the device was tested, with the following comment:

> It was found that this platform was an extremely stiff appendage to the parent dinghy and the rigidity of its outer end was quite surprising. Boarding proved to be fully as easy as previously, but we fear that the rigidity may possibly lead to damage in heavy weather, and that before such a design is adopted, an extended trial at moorings should be made. In actual fact, during our boarding test, the platform started to tear apart from the main dinghy at (i) the upper outboard edge of a tube-end sticking area, and (ii) the centre of the apron.

Both failures occurred as the boarder paused when about to step into the parent dinghy, for a discussion on some point of the trial. These failures may be due in part to incomplete curing of the rubber solution, as, owing to the onset of winter, the tests were made within a few days of assembly, and the lowish temperature may have retarded the curing.

However, it is evident that the lack of a buoyant thwart near the main dinghy transfers all of the weight of the boarder (plus water) to these attachments which, acting in a nearly horizontal direction, are highly stressed. To take these stresses, the outer tube-end doubler should be wide; and the apron's (dinghy end) turn-up and doubler should be wide, stitched together and, so far as possible, unbroken. (In the trial model, weakness occurred due to the siting of existing hand-grips on the dinghy and hand holes in the apron, the position of the latter being as indicated dotted in Fig. 5.)

* * * * *

* * * The platform forms a stiff protuberance to the dinghy, so there is a possibility that it will be vulnerable, and the attachment needs to be very strong. * * *

11. The U.S. Army specification, the BRITISH MOTOR SHIP reference, and the Nicholl and Bicknell articles (finding 8) all relate to water ballast bags for inflatable life rafts. The Nicholl article, which is representative, teaches an inflatable life raft having four waterpockets attached to its bottom. The waterpockets fill with water when the raft is afloat and provide "additional stability and also reduce the rate of drift in a wind." The Bicknell article, at 20, adds the following:

> In our search for stability we must appreciate that high winds and seas can pick up a 20 seater [life raft] with, say, two survivors aboard and overturn it. This is less likely to occur in a fully loaded raft. However, there are ways of lessening this overturning by putting water stabilizing pockets back onto rafts and avoiding building floors directly onto the base line of the buoyancy chamber. In this way we achieve increased immersion which in turn lessens the opportunity for the wind and breaking water to get below the raft, which starts the overturning sequence.

Because the bags are wholly submerged, they add no weight to the raft when it is afloat in normal upright position. The stability they afford, therefore, is by virtue of (1) their protrusion into the water, thus creating drag resistance against

horizontal movement of the raft, and (2) downward force created, when pulled out of the water, to resist overturn of the raft.

12. British report No. F/Eq/304, dated March 1949, was written by V. N. Drake for the Marine Aircraft Experimental Establishment, an agency of the British Government. The report was typewritten and is a summary including drawings and photographs of work done in Great Britain to develop means for boarding large life rafts from the water. The report was stamped "unclassified" on its first page, meaning that its availability was not restricted under British military security regulations.

The Technical Information Bureau (T.I.B.), Ministry of Supply, a British Government agency, was responsible for distributing technical reports of work done by British Government departments, including the Marine Aircraft Experimental Establishment. T.I.B. kept records of distribution for each report on distribution cards called "T.I.B. Form 24." Each card showed the date, to whom, and in what quantity, copies of the report were distributed.

About 80 copies of the report were distributed by the T.I.B. between 1949 and 1955 to various British Government agencies, American Government personnel in Great Britain, and commercial companies. The commercial companies were R.F.D. Co., Ltd., Normalair Ltd., Elliot Equipment, Ltd., Sanders Roe, Ltd., British Overseas Airways Corp., and British European Airways Corp. The report was available to all "responsible applicants on request" who were free to use or dispose of the report as desired. It is not clear how or to what extent the T.I.B. made known to "responsible applicants" the availability of the report.

13. The Central Air Documents Office (CADO) was organized in 1949 by the U.S. Air Force and Navy to collect and disseminate documents relating to aircraft and their use, particularly to assist Defense Department contractors in research and development programs. CADO got documents from the U.S. military services, U.S. Government agencies, private industry, research and educational institutions, and foreign countries. CADO cataloged all documents it received by cards on which was set out a document's title, author, date, source, subject matter, and military security classification,

if any. Catalog cards were sent to user organizations registered with CADO to announce availability of documents. Upon request, CADO furnished documents to user organizations. User organizations included Navy and Air Force contractors, federal and state agencies, and other persons or corporations requiring information to perform military or other government work.

In 1953, CADO merged with the Armed Services Technical Information Agency (ASTIA). ASTIA's function, like CADO's, was to provide the widest possible dissemination of technical and scientific information for use in connection with U.S. military projects and contracts. ASTIA also supplied information regarding unclassified documents to the Office of Technical Services (OTS), U.S. Department of Commerce, for possible dissemination by general sales to the public.

ASTIA maintained a "field-of-interest" register by which government contractors could receive catalog cards listing the availability of technical documents in a particular field of technology. Contractors became eligible to receive cards, and thus notification of the availability of documents, by submitting to ASTIA a request to be a registered user. After registration, the contractor received notification by catalog card on a regular basis of availability of documents in its field of interest. ASTIA supplied particular documents to registered users on request.

The "field-of-interest" register and its services were available only to Defense Department agencies and their prime contractors. Subcontractors could obtain ASTIA services through their prime contractors. CADO and ASTIA supplied bibliographies of available documents to registered user organizations upon request. Thus, a newly registered user could be brought up-to-date on past documents by requesting a "Report Bibliography" which listed available documents in its field of interest. AiResearch Manufacturing Co., a division of plaintiff, became a CADO registered user organization in 1949.

14. A copy of the British report (No. F/Eq/304) was received by CADO before June 27, 1950, and was designated for identification as No. ATI-75198. By July 7, 1950, the report had been microfilmed and added to the collection of

CADO documents available for distribution. A catalog card was prepared for distribution to CADO user organizations. The card identified the report by title, author, originating agency, and date, and stated an abstract of its contents. The abstract said the report dealt with "improved means of boarding large emergency dinghies" including "a small independently inflated raft or * * * a built-in platform." The card noted the report was "unclassified"; listed the report under the categories "Life rafts; Flight Safety and Rescue; Survival and Rescue"; and stated that "copies of this report [are] obtainable from CADO." There is no evidence of how many such cards were sent by CADO (or later ASTIA) to user organizations. Nor is there evidence whether any copies of the report were requested or sent. Neither CADO nor ASTIA kept records showing requests for unclassified documents or to whom sent.

15. Alan B. Walker, the named-inventor on the Walker patent, was employed by Air Cruisers Company, Belmar, New Jersey, from August 1953 to June 1955. Plaintiff acquired Air Cruisers Company on or about July 1, 1954, and Air Cruisers thereafter operated as a division of plaintiff. Robert Bicknell was employed by Air Cruisers Company from June 1953 to 1957.

On February 14, 1955, Walker submitted to plaintiff an invention disclosure describing the boarding ramp essentially as shown in Figs. 1–3 of the Walker patent. The disclosure did not describe the water ballast pocket in combination with the boarding ramp as shown in Walker patent Fig. 4. A patentability study was made on Walker's proposal by the patent department of AiResearch Manufacturing Co., a division of plaintiff. The British Albrecht patent (finding 9) turned up in a prior art search; and it was concluded that the patentability of Walker's proposed ramp was doubtful. By memorandum dated March 28, 1955, Walker suggested his proposed ramp be modified by adding thereto the water ballast pocket as shown in patent Fig. 4. The memorandum said that Robert Bicknell had suggested the idea of the ballast pocket and referred to a drawing made by Walker which showed the details of construction of the ballast pocket. Bicknell testified at trial that he could not recall suggesting

the use of a ballast pocket, and his recollection was not refreshed by the Walker memorandum.

16. During trial, the parties conducted tests in the swimming pool of the Navy Yard, Washington, D.C., to compare the boarding ramp of the F–2B raft with the ramp of the Albrecht patent (finding 9). The trial commissioner attended the tests, and both still and motion pictures were made and later introduced into evidence. Defendant used an F–2B raft, made by the Patten Company for the government, to which was attached a boarding ramp as called for in the military specification and an additional boarding ramp, purportedly made in accordance with the teachings of Albrecht. Defendant's "Albrecht" ramp resembled an air mattress with dimensions 5 inches thick, 40 inches wide and 44 inches long. When inflated, its buoyancy supported about 300 pounds. It was attached to the lower tube of the raft with sealing tape, the cross-section of the place of attachment being about 5 inches by 40 inches. Plaintiff at the test used a double-tube raft resembling the Walker raft, to which was attached a ramp, purportedly made in accordance with the teachings of Albrecht. Plaintiff's "Albrecht" ramp differed from defendant's in that it was 3 inches thick, rather than 5; was attached to the lower tube of the raft by a fabric hinge; and had buoyancy to support about 185 pounds.

The parties each furnished a swimmer, clothed in flight gear, who boarded the rafts by the available ramps, first using both arms, then simulating an injured arm. The tests were run both with and without life vests. The rafts and ramps were inflated to a pressure of 1.5 p.s.i.g., as required by the military specification. The purpose of the tests was to compare the ramps for relative ease of boarding and stability. Plaintiff's version of the Albrecht ramp was least stable and provided the least buoyancy and assistance to the swimmers while boarding the raft. In one test, the ramp rolled under the raft due to the weight of the swimmers, rendering the ramp useless until righted. Defendant's version of the Albrecht ramp was more stable and provided more buoyancy and assistance to the swimmers. However, it too rolled under the raft in one test. The two-beam ramp of the F–2B raft, as furnished under the military specifica-

tion, was stable and gave the swimmers good support under all boarding-test conditions. At times, its end and side submerged momentarily under the weight of the swimmers as they climbed onto the ramp. However, the ramp stayed essentially horizontal at or near water level during most of the boarding process.

To the extent conclusions can be drawn from the limited tests of the parties, and recognizing that sea state and experience of swimmers is pertinent to ramp stability, the two-beam ramp of the F–2B raft was superior in performance to either version of Albrecht.

THE TAYLOR PATENT

17. The Taylor patent discloses structure for supporting a canopy over an inflatable life raft. As shown in patent Figs. 2 and 5 (reproduced herein), support posts 18, spaced around the raft's upper buoyancy tube 10, are mounted high on the tube in outwardly inclined position. Posts 18 are secured to tube 10 by means of sockets 27 into which the post end is inserted and fastened by spring clip 28. Clip 28 is hinge-connected to post 18 at a point just above the top of socket 28 (Fig. 2) so that the clip can swing under socket 27 and prevent post 18 from inadvertently coming out of the socket. Grommeted bracket flaps 26, sewed to the upper part of tube 10, lend further support to the posts. Posts 18 are put in position by pushing their upper ends through the grommet of flap 26, then inserting their lower ends into socket 27. Canopy 16 is supported over the raft solely by posts 18 and oar 15 (Fig. 5).

The patent specification says that the structure above-described has the following advantages: (1) Because the posts are not supported by the raft floor, they are short and thus more conveniently stowed with the raft in deflated condition; (2) the posts do not obstruct occupants of the raft; and (3) the outward inclination of the posts permits the canopy to extend over the raft tubes, like eaves, to provide better protection against sun and weather. Evidence at trial further established that fewer posts are necessary to support a canopy in the Taylor structure than in prior structures where the posts were not inclined, but rather were vertical.

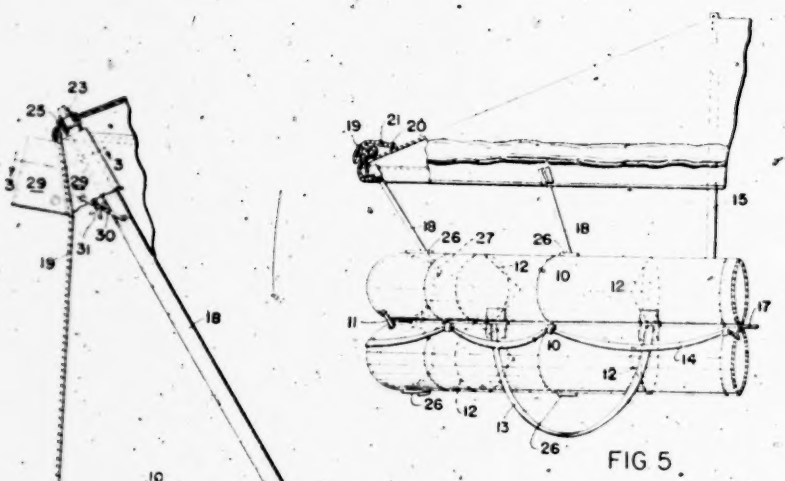

FIG 5.

FIG 2

18. Claims 1, 2 and 3, the only claims of the Taylor patent in issue, define the canopy mounting structure in combination with a life raft and are set out below in outline form:

1. A life raft comprising

   a flexible-walled, fluid distensible buoyancy member of substantially circular cross-sectional shape,

   a canopy-supporting post, and

   means for supporting said post, wholly from said buoyancy member, in an outwardly inclined position, said means comprising

   post-holding means secured to the inboard side of the fluid distensible buoyancy member and wholly supported directly thereby.

2. A life raft as defined in claim 1 in which the defined post-holding means comprises

   an apertured fabric member secured to approximately the highest part of the buoyancy member and

a molded rubber tubular member secured at a lower position to the inboard side of the buoyancy member and having the post in its tubular portion.

3. A life raft as defined in claim 1 [2?] in which the defined post-holding means comprises

an apertured fabric member secured to approximately the higliest part of the buoyancy member, and means for limiting endwise movement of the post in the tubular portion of the tubular member.

Claim 3 was apparently intended to depend on claim 2, rather than claim 1, since there is no antecedent basis in claim 1 for the terms "tubular portion" and "tubular member," and claim 3 is therefore incomplete. 37 C.F.R. § 1.75 (revised as of Jan. 1, 1967); MANUAL OF PATENT EXAMINING PROCEDURE (3d ed. 1961), ¶ 608.01(n), as revised 14 October 1967, and ¶ 706.03(f), as revised 5 July 1965.

19. Plaintiff contends claims 1, 2 and 3 of the Taylor patent are infringed by the F–2B raft (finding 7). The F–2B raft has a canopy structure which includes canopy support posts mounted in sockets and inclined outwardly of the raft. The sockets are fastened to the inboard side of the raft buoyancy tubes (6 per tube) just above the point of tangency around the inner perimeter of the tubes. Above each socket and near the top of the tube is fastened a fabric patch with a grommeted hole through which the post is passed before insertion in the socket. The bottom end of the socket is closed so to limit downward movement of an inserted post. The post has a retractable metal clip, like a conventional umbrella spring clip, near its lower end which projects outwardly from opposite sides of the post and limits the post's upward movement through the grommet in the fabric flap, thus preventing inadvertent removal of the post from the socket. The post is thus confined in place by the closed-end socket and the umbrella-type spring clip.

20. Defendant relies on the following prior art devices and documents:

(a) Mark IV sailing raft;
(b) AR–10 pneumatic boat;
(c) F–2 life raft;
(d) Hallward, U.S. Patent No. 2,413,226, issued December 24, 1946; and

(e) Boyle et al, U.S. Patent No. 2,764,766, issued October 2, 1956 (application filed July 22, 1953).

Document (d) was considered by the Patent Office during prosecution of the Taylor patent application. Also considered was part of POPULAR MECHANICS magazine, July 1951, which describes a raft similar to the F–2.

21. The Mark IV sailing raft was designed in 1943 by Fred Patten, president of the Patten Company (finding 7), while employed by the U.S. Rubber Company. It was purchased by the U.S. Navy for experimental purposes. The Mark IV was an inflatable raft having a single buoyancy tube and a canopy structure. The AR–10 pneumatic boat was used by the U.S. Navy in 1945. It comprised a main inflatable tube which encircled a deck floor, a second tube attached above the main tube, and a canopy structure. In both the Mark IV and AR–10, the canopy was supported by posts mounted on the inboard side of the buoyancy tube (main tube in the AR–10) in sockets and apertured flaps secured near (or below) the point of tangency of the inner perimeter of the tube. The posts did not incline outwardly of the raft but were substantially vertical.

The canopy of the AR–10 did not cover the entire raft; and it was supported, in addition to the posts, by tie-cords which were fastened to the edge of the canopy through eyelets and secured to the raft near the floor. It is not clear in the record whether the canopy of the Mark IV was supported solely by the posts or partly by securing the canopy edge to the top of the raft tube.

22. The F–2 life raft is described in military specification MIL–R–6680(USAF), dated June 6, 1951. It comprises, in essence, a pair of superposed inflatable tubes with a fabric floor in between and a canopy. The canopy is supported by 12 posts which fit into sockets secured to the raft floor and pass through sleeves secured to the inboard side of the inflatable tube. The specification says that the "sockets shall be located on the floor directly in line with the sleeves so as to hold the supports in an upright position." Thus, the posts are not intended to incline outwardly of the raft. Affixed to each post near the bottom is a 12-inch length of cord which is to be tied to the socket on the floor to prevent inadvertent upward movement of the posts.

23. The Hallward patent, cited by the Patent Office during prosecution of the Taylor patent application, relates to life rafts, not of the inflatable tube type but rather "constructed to form a plurality of compartments or bays which are filled with buoyant solid material," such as wood. The raft has a canopy structure comprising four poles located at the corners of the raft and set in sockets in the raft deck "to support a waterproof fabric cover * * * having sides which may be raised or lowered as needed." Though the patent specification does not describe in detail the poles or their orientation, the patent drawing shows the posts inclined slightly outwardly. It is not clear from the specification or drawings how the poles are supported above the socket against pivoting inwardly due to the weight of the canopy.

24. The Boyle patent relates to inflatable life rafts having four superposed inflatable tubes with a fabric floor or deck between the second and third tubes. The tubes encircle the floor to form an occupant-receiving space. The raft has a canopy structure which includes support posts mounted in sleeves and sockets secured in vertical alignment to the outside of the upper two buoyancy tubes. A weather or spray shield is fastened to the posts and encircles the raft just above the uppermost buoyancy tube. The canopy, when secured to the posts, covers the top of the raft and the posts bend inwardly 90° to support the canopy. The specification says that the posts are mounted outside the buoyancy tubes, rather than inside, to give the raft "large internal capacity" and "their resilience keeps the spray shield and canopy tensioned."

25. British patent No. 726,833 (published March 23, 1955) is relied on to show the level of ordinary skill in the art at about the time the invention in suit was made. The British patent is not statutory prior art because it was published after the filing date of the Taylor patent application (July 15, 1954). It relates to inflatable life rafts which have

> * * * inflatable arched thwarts secured at the forward and after ends to the main buoyancy tube in such manner that when the raft is in use the arched thwarts extend above the main buoyancy tube and serve to support a tent-like structure for protection of the occupants of the raft.

* * * * *

The thwarts are inflatable tubes secured to the top of the main buoyancy tube. The canopy is double-layered to afford protection to raft occupants in arctic weather conditions. The lower part of the canopy at the raft ends can be opened to provide an "entry mouth" into the raft. The canopy at the mouth is propped open by a pair of poles which fit into sockets fastened to the exterior of the main buoyancy tube. The poles slant outwardly to hold up the canopy at the "entry mouth." The poles do not otherwise support the canopy.

26. The following military specifications are in evidence and show the structure of inflatable life rafts required by the military services from 1951 to 1959:

Military Specification	Date	Raft Designation
MIL-R 6680(USAF)	6 June 1951	F-2
MIL-R 6680A(USAF)	29 February 1952	F-2A
MIL-R 6680B(ASG)	13 February 1953	F-2A
MIL-R 9131(USAF)	24 September 1953	F-2A
MIL-R-9131A(USAF)	15 March 1955	F-2A
MIL-R 009131B(USAF)	25 February 1957	F-2B
MIL-R 009131C(USAF)	19 July 1957	F-2B
MIL-L-009131D(Aer)	6 October 1959	F-2B

Rafts designated F-2 and F-2A have identical canopy assemblies (finding 22). Rafts designated F-2B have identical canopy assemblies (finding 19), except that in the specifications 9131B and 9131C, the spring clip used to prevent lengthwise movement of the post in the socket is substantially identical to Fig. 4 of the Taylor patent rather than as described in finding 19. The F-2 and F-2A rafts do not have a boarding ramp like the F-2B but rather boarding stirrups attached to the outside of the buoyancy tube.

Prior to 1957, defendant procured F-2 and F-2A rafts from the Patten Company and from Air Cruisers Company, a division of plaintiff. So far as is here material, the design of the F-2 and F-2A remained unchanged in military specifications applicable from 1951 to 1957. In 1956, upon request of U.S. Air Force representatives at Wright Field, Ohio, plaintiff made and tested a raft like the F-2A, but with a boarding ramp, similar to the one shown in the Walker patent. Following successful testing, Air Cruisers submitted to the Air Force an engineering change proposal under which F-2A rafts would be modified to add the boarding

ramp. The proposal was accepted. Plaintiff also submitted drawings showing a canopy support assembly similar to that shown in the Taylor patent, as well as a boarding ramp similar to that shown in the Walker patent. In 1957, the Air Force issued military specification MIL-R-009131B (USAF) for the F-2B raft and requested bids for procurement thereunder. The Patten Company was the successful bidder. There has been no significant procurement of F-2A rafts since 1958.

CONCLUSION OF LAW

Upon the foregoing findings of fact, which are made a part of the judgment herein, the court concludes as a matter of law as follows:

U.S. Patent No. 2,914,779 —claims 2, 5, and 6 are invalid; claim 3 is valid and infringed.

U.S. Patent No. 2,804,633 —claims 1-3 are valid and infringed.

Accordingly, plaintiff is entitled to recover reasonable and entire compensation for unauthorized use by defendant of the patented inventions defined in claim 3 of U.S. Patent No. 2,914,779 and in claims 1-3 of U.S. Patent No. 2,804,633, and judgment is entered to that effect. The extent of liability will be determined in further proceedings before a trial commissioner, pursuant to Rule 47(c)(2) [since September 1, 1969, Rule 131(c)(2)]. All claims asserted in the petition, other than those for which plaintiff is held to be entitled to recover, are dismissed.